

CLAIMS

1. A method of positioning a radio transmitter characterized in that distance to a receiver of known position is determined according to a parameter reflecting propagation delay time and that direction from the receiver to the transmitter is determined from a respective
5 at least one parameter reflecting received signal level in a cell/sector where the transmitter is camping or being served and signal level in a co-sited cell/sector, the parameter determining direction from stored assisting position data.
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2. The method according to claim 1 characterized in that the assisting position data is classified in intervals of one or more parameters.
3. The method according to claim 2 characterized in that the position data in each interval is
15 averaged over the interval of each of the one or more parameters.
4. The method according to claim 3 characterized in that the one or more parameters include received signal level.
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5. The method according to claim 3 characterized in that the one or more parameters include timing advance.
6. The method according to claim 3 characterized in that the stored assisting position data is
25 average position data.
7. The method according to claim 1 characterized in that the assisting position data is GPS or other satellite positioning system position data.

8. The method according to claim 7 c h a r a c t e r -
i z e d i n that for a public mobile radio communication
system with a plurality of subscriber receivers the assist-
ing position data is received from one or more subscriber
5 receivers.

9. The method according to claim 1 c h a r a c t e r -
i z e d i n that the co-sited cell/sector is at least one
of the cells/sectors being immediate neighbors of the cell
where the transmitter is camping or being served.

10 10. The method according to claim 1 c h a r a c t e r -
i z e d i n that direction to the transmitter is deter-
mined by forming a linear scale ratio of or dB-scale dif-
ference between the neighbor cell/sector received level and
received level of the cell/sector where the transmitter is
15 camping or being served.

11. The method according to claim 1 c h a r a c t e r -
i z e d i n that determination of transmitter positioning
includes cell/sector identity.

12. The method according to claim 1 c h a r a c t e r -
20 i z e d i n that the received signal level is averaged
prior to forming a basis for positioning.

13. The method according to claim 12 c h a r a c t e r -
i z e d i n that the average is formed in a network con-
trol element.

25 14. The method according to claim 13 c h a r a c t e r -
i z e d i n that the network control element is an entity
most closely connected to the receiver entity over a stan-
dardized interface.

15. The method according to claim 14 c h a r a c t e r -
i z e d i n that the entity most closely connected to the
receiver is a base station controller.

16. The method according to claim 14 c h a r a c t e r -
5 i z e d i n that the entity most closely connected to the
receiver is a radio network controller.

17. A device of positioning a radio transmitter c h a r -
a c t e r i z e d b y processing means for determining
distance to a receiver of known position according to at
10 least one parameter reflecting propagation delay time and
direction from the receiver to the transmitter from a re-
spective parameter reflecting received signal level in a
cell/sector where the transmitter is camping or being
served and signal level in a co-sited cell/sector, the pa-
15 rameter determining direction from stored assisting posi-
tion data; and storage means for storing of assisting posi-
tion data in relation to the at least one parameter.

18. The device according to claim 17 c h a r a c t e r -
i z e d i n that the assisting position data is classi-
20 fied in intervals of one or more parameters.

19. The device according to claim 18 c h a r a c t e r -
i z e d b y processing means for averaging position data
in each interval over the interval of each of the one or
more parameters.

20. The device according to claim 19 c h a r a c t e r -
25 i z e d i n that the one or more parameters include re-
ceived signal level.

21. The device according to claim 19 c h a r a c t e r -
i z e d i n that the one or more parameters include tim-
30 ing advance.

22. The device according to claim 19 c h a r a c t e r -
i z e d i n that the stored assisting position data is
average position data.

23. The device according to claim 17 c h a r a c t e r -
5 i z e d i n that the assisting position data is GPS or
other satellite positioning system position data.

24. The device according to claim 7 c h a r a c t e r -
i z e d i n that for a public mobile radio communication
system with a plurality of subscriber receivers the assist-
10 ing position data is received from one or more subscriber
receivers.

25. The device according to claim 17 c h a r a c t e r -
i z e d i n that the co-sited cell/sector is at least one
of the cells/sectors being immediate neighbors of the cell
15 where the transmitter is camping or being served.

26. The device according to claim 17 c h a r a c t e r -
i z e d i n that direction to the transmitter is deter-
mined by forming a ratio of the neighbor cell/sector re-
ceived level and received level of cell/sector where the
20 transmitter is camping or being served.

27. The device according to claim 17 c h a r a c t e r -
i z e d b y the processing means including cell/sector
identity determination of transmitter positioning.

28. The device according to claim 17 c h a r a c t e r -
25 i z e d b y the processing means forming a time average
of received signal level prior to forming a basis for posi-
tioning.

29. The device according to claim 28 c h a r a c t e r -
i z e d i n that the average is formed in a network con-
30 trol element.

30. The device according to claim 29 c h a r a c t e r -
i z e d i n that the network control element is an entity
most closely connected to the receiver entity over a stan-
dardized interface.

5 31. The device according to claim 30 c h a r a c t e r -
i z e d i n that the entity most closely connected to the
receiver is a base station controller.

32. The device according to claim 30 c h a r a c t e r -
i z e d i n that the entity most closely connected to the
10 receiver is a radio network controller.

33. Radio communication system c h a r a c t e r i z e d
b y means for carrying out the method in any of claims
1-16.

34. Radio communication system c h a r a c t e r i z e d
15 b y a plurality of devices in any of claims 17-32.